

SEQUENCE LISTING

1AP20 Rec'd PCT/PTO 01 JUN 2006

<110> Tsunoda, Hiroyuki
Habu, Kiyoshi

<120> EXPRESSION SYSTEMS USING MAMMALIAN BETA-ACTIN PROMOTER

<130> 14875-162US1

<150> PCT/JP2004/018006

<151> 2004-12-03

<150> JP 2003-405269

<151> 2003-12-03

<160> 39

<170> PatentIn version 3.1

<210> 1

<211> 1577

<212> DNA

<213> Mus musculus

<400> 1

```

gggagtgact ctctgtccat tcaatccagg ccccgcggtgt ccctcaaaca agaggccaca      60
caaatagggt ccgggcctcg atgtgaccc tcatccactt aagtgtcga tatccacgtg      120
acatccacac ccagagggtc ctgggggtgt tgggtgaccc ccagaatgca ggcctagtaa      180
ccgagacatt gaatggggca gtgtccacaa gggcggaggc tattcctgta catctgggcc      240
tacggagcca gcacccatcg ccaaaactct tcatcctctt cctcaatctc gctttctctc      300
tcgctttttt ttttttttct tcttcttttt tttttttttt ttcaaaagga ggggagaggg      360
ggtaaaaaaa tgctgcactg tgcggcgagg ccggtgagtg agcgacgcgg agccaatcag      420
cgcccgccgt tccgaaagtt gccttttatg gctcgagtg ccgctgtggc gtcctataaa      480
acccggcggc gcaacgcgca gccactgtcg agtcgcgtcc acccgcgagc acagcttctt      540
tgcagctcct tcgttgccgg tccacaccog ccaccaggta agcagggacg ccgggcccag      600
cgggccttcg ctctctcgtg gctagtacct cactgcaggg tcctgaggat cactcagaac      660
ggacaccatg ggcgggtgga ggggtggtgcc gggccgcgga gcggacactg gcacagccaa      720
ctttacgcct agcgtgtaga ctctttgcag ccacattccc gcggtgtaga cactcgtggg      780
cccgctcccg ctcggtgcgt ggggcttggg gacacactag ggtcgcggtg tgggcatttg      840
atgagccggt gcggcttgcg ggtgttaaaa gccgtattag gtccatcttg agagtacaca      900
gtattgggaa ccagacgcta cgatcacgcc tcaatggcct ctgggtcttt gtccaaaccg      960

```

gtttgcctat tcggcttgcc gggcgggcgg gcgggcgggc gggcgcggca gggccggctc 1020
 ggccgggtgg gggctgggat gccactgcgc gtgcgctctc tatcactggg catcgaggcg 1080
 cgtgtgcgct agggagggag ctcttctctc cccctctctc ctagttagct gcgcgtgcgt 1140
 attgaggctg ggagcgcggc tgcccggggg tgggcgaggg cggggccggt gtccggaagg 1200
 ggcgggggtca cagtggcacg ggcgccttgt ttgcgcttcc tgctgggtgt ggtcgcctcc 1260
 cgcgcgcgca caagccgccc gtcggcgagc tgtaggcgga gcttgcgccc gtttggggag 1320
 ggggcggagg tctggcttcc tgccctaggt ccgcctccgg gccagcgttt gccttttatg 1380
 gtaataatgc ggccgggtctg cgttctcttt gtcccctgag cttgggcgcg cggcccttgg 1440
 cggctcgagc ccgcggcttg ccggaagtgg gcagggcggc agcggctgct cttggcggcc 1500
 ccgaggtgac tatagccttc ttttgtgtct tgatagtctg ccatggatga cgatatcgct 1560
 gcgctggtcg tcgacaa 1577

<210> 2
 <211> 1542
 <212> DNA
 <213> Mus musculus

<400> 2
 gggagtgact ctctgtccat tcaatccagg cccgcggtgt ccctcaaaca agaggccaca 60
 caaatagggg ccgggcctcg atgctgacct tcatccactt aagtgctcga tatccacgtg 120
 acatccacac ccagaggggtc ctgggggtggg tgggtgacct ccagaatgca ggcctagtaa 180
 ccgagacatt gaatggggca gtgtccacaa gggcggaggc tattcctgta catctgggcc 240
 tacggagcca gcacccatcg ccaaaactct tcatcctctt cctcaatctc gctttctctc 300
 tcgctttttt ttttttttct tcttcttttt tttttttttt ttcaaaagga ggggagaggg 360
 ggtaaaaaaa tgctgcactg tgcggcgagg ccggtgagtg agcgacgcgg agccaatcag 420
 cgcccgcggt tccgaaagt gccttttatg gctcgagtgg ccgctgtggc gtcctataaa 480
 acccggcggc gcaacgcgca gccactgtcg agtcgctcc acccgcgagc acagcttctt 540
 tgcagctcct tcgttgccgg tccacacccg ccaccaggta agcagggacg ccgggcccag 600
 cgggccttcg ctctctctgt gctagtacct cactgcaggg tcttgaggat cactcagaac 660
 ggacaccatg ggcgggtgga ggggtggtgcc gggccgcgga gcggacactg gcacagccaa 720
 ctttacgcct agcgtgtaga ctctttgcag ccacattccc gcggtgtaga cactcgtggg 780
 cccgctcccc ctcggtgcgt ggggcttggg gacacactag ggtcgcggtg tgggcatttg 840

```

atgagccggt gcggtcttgcg ggtgttaaaa gccgtattag gtccatcttg agagtacaca    900
gtattgggaa ccagacgcta cgatcacgcc tcaatggcct ctgggtcttt gtccaaaccg    960
gtttgcctat tcggcttgcc gggcgggagg gcgggcgggc gggcgcgga gggccggctc    1020
ggccgggtgg gggctgggat gccactgcgc gtgcgtcttc tatcactggg catcgaggcg    1080
cgtgtgcgct agggagggag ctcttcctct cccctcttc ctagttagct gcgcgtgcgt    1140
attgaggctg ggagcgcggc tgcccggggt tgggcgaggg cggggccggt gtccggaagg    1200
ggcgggggtca cagtggcacg ggcgccttgt ttgcgtcttc tgctgggtgt ggtcgcctcc    1260
cgcgcgcgca caagccgcc gtcggcgag tgtaggcgga gcttgcgcc gtttggggag    1320
ggggcgagg tctggcttcc tgccctaggt ccgcctccgg gccagcggtt gccttttatg    1380
gtaataatgc ggccggtctg cgcttccttt gtccctgag cttgggcgcg cggccctgg    1440
cggtctgagc ccgcggcttg ccggaagtgg gcagggcggc agcggtgct cttggcgggc    1500
ccgaggtgac tatagccttc ttttgtgtct tgatagttcg cc                    1542

```

```

<210> 3
<211> 604
<212> DNA
<213> Woodchuck hepatitis virus

```

```

<400> 3
tctagaaatc aacctctgga ttacaaaatt tgtgaaagat tgactggtat tcttaactat    60
gttgctcctt ttacgctatg tggatacgct gctttaatgc ctttgtatca tgctattgct    120
tcccgtatgg ctttcatttt ctctccttg tataaatcct ggttgctgtc tctttatgag    180
gagttgtggc ccgttgtcag gcaacgtggc gtgggtgtgca ctgtgtttgc tgacgcaacc    240
cccactggtt ggggcattgc caccacctgt cagctccttt ccgggacttt cgctttcccc    300
ctccctattg ccacggcgga actcatcgcc gcctgccttg cccgctgctg gacaggggct    360
cggctgttgg gcaactgaaa ttccgtggtg ttgtcgggga agctgacgtc ctttccatgg    420
ctgctcgctt gtgttgccac ctggattctg cgcgggacgt cttctgcta cgtcccttcg    480
gccctcaatc cagcggacct tccttccgc ggctgctgc cggctctgcg gcctcttcg    540
cgtcttcgcc ttcgccctca gacgagtcgg atctcccttt gggccgcctc cccgcctgtc    600
taga                                                604

```

```

<210> 4
<211> 366
<212> DNA

```

<213> Homo sapiens

<400> 4

tagttattaa tagtaatcaa ttacggggtc attagttcat agcccatata tggagttccg	60
cgttacataa cttacggtaa atggcccgcg tggctgaccg cccaacgacc cccgcccatt	120
gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca	180
atgggtggag tattttacggg aaactgcccc cttggcagta catcaagtgt atcatatgcc	240
aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgccagta	300
catgacctta tgggactttc ctacttggca gtacatctac gtattagtca tcgctattac	360
catggt	366

<210> 5

<211> 660

<212> DNA

<213> Mus musculus

<400> 5

tcttgattg gcagccgctg tagaagctat gacagaatac aagcttgtgg tggtagggcg	60
tggaggcgtg ggaaagagtg ccctgacat ccagctgatc cagaaccact ttgtggacga	120
gtatgatccc actatagagg actcctaccg gaaacagggtg gtcattgatg gggagacatg	180
tctactggac atcttagaca cagcagggtca agaagagtat agtgccatgc gggaccagta	240
catgcgacac ggggagggct tctctgtgtg atttgccatc aacaacacca agtccttcga	300
ggacatccat cagtacaggg agcagatcaa gcgggtgaaa gattcagatg atgtgccaat	360
ggtgctggtg ggcaacaagt gtgacctggc tgctcgact gttgagtctc ggcaggccca	420
ggaccttgct cgcagctatg gcatccccta cattgaaaca tcagccaaga cccggcaggg	480
cgtggaggat gccttctata cactagtccg tgagattcgg cagcataaat tgcggaaact	540
gaaccacccc gatgagagtg gtcttggtg catgagctgc aaatgtgtgc tgtcctgaca	600
ccaggtgagg cagggaccag cgagacgtct ggggcagtga cctcagctag ccagatgaac	660

<210> 6

<211> 576

<212> DNA

<213> Mus musculus

<400> 6

gccacatga cagaatacaa gcttgtggtg gtgggcgctg gaggcgtggg aaagagtgcc	60
ctgaccatcc agctgatcca gaaccacttt gtggacgagt atgatccac tatagaggac	120

```

tcctaccgga aacaggtggt cattgatggg gagacatgtc tactggacat cttagacaca 180
gcaggtcaag aagagtatag tgccatgctg gaccagtaca tgcgcacagg ggagggcttc 240
ctctgtgtat ttgccatcaa caacaccaag tccttcgagg acatccatca gtacaggag 300
cagatcaagc gggtgaaaga ttcagatgat gtgccaatgg tgctgggtggg caacaagtgt 360
gacctggctg ctcgcactgt tgagtctcgg caggcccagg accttgctcg cagctatggc 420
atcccctaca ttgaaacatc agccaagacc cggcagggcg tggaggatgc cttctataca 480
ctagtccgtg agattcggca gcataaattg cggaactga acccaccgca tgagagtgg 540
cctggctgca tgagctgcaa atgtgtgctg tcctga 576

```

```

<210> 7
<211> 189
<212> PRT
<213> Mus musculus

```

```

<400> 7
Met Thr Glu Tyr Lys Leu Val Val Val Gly Ala Val Gly Val Gly Lys
1      5      10     15

Ser Ala Leu Thr Ile Gln Leu Ile Gln Asn His Phe Val Asp Glu Tyr
20     25     30

Asp Pro Thr Ile Glu Asp Ser Tyr Arg Lys Gln Val Val Ile Asp Gly
35     40     45

Glu Thr Cys Leu Leu Asp Ile Leu Asp Thr Ala Gly Gln Glu Glu Tyr
50     55     60

Ser Ala Met Arg Asp Gln Tyr Met Arg Thr Gly Glu Gly Phe Leu Cys
65     70     75     80

Val Phe Ala Ile Asn Asn Thr Lys Ser Phe Glu Asp Ile His Gln Tyr
85     90     95

Arg Glu Gln Ile Lys Arg Val Lys Asp Ser Asp Asp Val Pro Met Val
100    105    110

Leu Val Gly Asn Lys Cys Asp Leu Ala Ala Arg Thr Val Glu Ser Arg
115    120    125

Gln Ala Gln Asp Leu Ala Arg Ser Tyr Gly Ile Pro Tyr Ile Glu Thr
130    135    140

Ser Ala Lys Thr Arg Gln Gly Val Glu Asp Ala Phe Tyr Thr Leu Val
145    150    155    160

Arg Glu Ile Arg Gln His Lys Leu Arg Lys Leu Asn Pro Pro Asp Glu
165    170    175

Ser Gly Pro Gly Cys Met Ser Cys Lys Cys Val Leu Ser

```

185

```
<210> 8
<211> 188
<212> PRT
<213> Homo sapiens
```

<400>	8														
Met	Thr	Glu	Tyr	Lys	Leu	Val	Val	Val	Gly	Ala	Val	Gly	Val	Gly	Lys
1				5					10					15	
Ser	Ala	Leu	Thr	Ile	Gln	Leu	Ile	Gln	Asn	His	Phe	Val	Asp	Glu	Tyr
			20					25					30		
Asp	Pro	Thr	Ile	Glu	Asp	Ser	Tyr	Arg	Lys	Gln	Val	Val	Ile	Asp	Gly
		35					40					45			
Glu	Thr	Cys	Leu	Leu	Asp	Ile	Leu	Asp	Thr	Ala	Gly	Gln	Glu	Glu	Tyr
	50					55					60				
Ser	Ala	Met	Arg	Asp	Gln	Tyr	Met	Arg	Thr	Gly	Glu	Gly	Phe	Leu	Cys
65					70					75					80
Val	Phe	Ala	Ile	Asn	Asn	Thr	Lys	Ser	Phe	Glu	Asp	Ile	His	His	Tyr
				85					90					95	
Arg	Glu	Gln	Ile	Lys	Arg	Val	Lys	Asp	Ser	Glu	Asp	Val	Pro	Met	Val
			100					105					110		
Leu	Val	Gly	Asn	Lys	Cys	Asp	Leu	Pro	Ser	Arg	Thr	Val	Asp	Thr	Lys
		115					120					125			
Gln	Ala	Gln	Asp	Leu	Ala	Arg	Ser	Tyr	Gly	Ile	Pro	Phe	Ile	Glu	Thr
		130				135					140				
Ser	Ala	Lys	Thr	Arg	Gln	Gly	Val	Asp	Asp	Ala	Phe	Tyr	Thr	Leu	Val
145					150					155					160
Arg	Glu	Ile	Arg	Lys	His	Lys	Glu	Lys	Met	Ser	Lys	Asp	Gly	Lys	Lys
				165					170					175	
Lys	Lys	Lys	Lys	Ser	Lys	Thr	Lys	Cys	Val	Ile	Met				
			180					185							

<210>	9
<211>	27
<212>	DNA
<213>	Artificial

<220>
<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

```
<400> 9
gggagtgact ctctgtccat tcaatcc
```

<210> 10
 <211> 27
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 10
 ttgtcgacga ccagcgcagc gatatcg 27

<210> 11
 <211> 26
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 11
 agatctggga gtgactctct gtccat 26

<210> 12
 <211> 26
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 12
 aagcttggcg aactatcaag acacaa 26

<210> 13
 <211> 50
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 13
 aatcaacctc tggattacaa aatttgtaa agattgactg gtattcttaa 50

<210> 14
 <211> 50
 <212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 14

gcgtatccac atagcgtaaa aggagcaaca tagttaagaa taccagtcaa 50

<210> 15

<211> 50

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 15

acgctatgtg gatacgctgc tttaatgcct ttgtatcatg ctattgcttc 50

<210> 16

<211> 50

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 16

ttatacaagg aggagaaaat gaaagccata cggaagcaa tagcatgata 50

<210> 17

<211> 50

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 17

ttctcctcct tgtataaatc ctggttgctg tctctttatg aggagttgtg 50

<210> 18

<211> 50

<212> DNA

<213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 18
gtgcacacca cgccacgttg cctgacaacg ggccacaact cctcataaag 50

<210> 19
<211> 50
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 19
cgtggcgtgg tgtgcactgt gtttgctgac gcaaccccca ctggttgggg 50

<210> 20
<211> 50
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 20
gtcccggaaa ggagctgaca ggtggtggca atgccccaac cagtgggggt 50

<210> 21
<211> 50
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 21
cagctccttt ccgggacttt cgctttcccc ctccctattg ccacggcgga 50

<210> 22
<211> 50
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 22
tgtccagcag cgggcaaggc aggcggcgat gagttccgcc gtggcaatag 50

<210> 23
 <211> 50
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 23
 ttgcccgctg ctggacaggg gctcggctgt tgggcactga caattccgtg 50

<210> 24
 <211> 50
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 24
 ccatggaaag gacgtcagct tccccgacaa caccacggaa ttgtcagtgc 50

<210> 25
 <211> 50
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 25
 tgacgtcctt tccatggctg ctgcctgtg ttgccacctg gattctgcgc 50

<210> 26
 <211> 50
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 26
 gagggccgaa gggacgtagc agaaggacgt cccgcgcaga atccaggtgg 50

<210> 27
 <211> 50
 <212> DNA
 <213> Artificial

<220>
 <223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 27
 acgtcccttc ggccctcaat ccagcggacc ttccttcccg cggcctgctg 50

<210> 28
 <211> 57
 <212> DNA
 <213> Artificial

<220>
 <223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 28
 gagggcgaag gcgaagacgc ggaagaggcc gcagagccgg cagcaggccg cgggaag 57

<210> 29
 <211> 56
 <212> DNA
 <213> Artificial

<220>
 <223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 29
 gtcttcgcct tcgccctcag acgagtcgga tctccctttg ggccgcctcc ccgcct 56

<210> 30
 <211> 30
 <212> DNA
 <213> Artificial

<220>
 <223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 30
 tctagaaatc aacctctgga ttacaaaatt 30

<210> 31
 <211> 26
 <212> DNA
 <213> Artificial

<220>
 <223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 31

tctagaaggc ggggaggcgg cccaaa

26

<210> 32
 <211> 25
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 32
 atcctgggtg ctgtctcttt atgag

25

<210> 33
 <211> 22
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 33
 gtgcacacca cgccacgttg cc

22

<210> 34
 <211> 27
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 34
 tcctggattg gcagccgctg tagaagc

27

<210> 35
 <211> 27
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 35
 gttcatctgg ctagctgagg tcactgc

27

<210> 36
 <211> 24

<212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 36
 gccaccatga cagaatacaa gctt

24

<210> 37
 <211> 20
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 37
 tcaggacagc acacatttgc

20

<210> 38
 <211> 27
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 38
 gtggtgggcg ctgtaggcgt gggaaag

27

<210> 39
 <211> 27
 <212> DNA
 <213> Artificial

<220>

<223> Description of Artificial Sequence : Artificially Synthesized Primer Sequence

<400> 39
 ctttcccacg cctacagcgc ccaccac

27